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**A METHOD OF HANDLING ELECTRONIC DEVICES INSTALLED IN NETWORKS**

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**Abstract**

In a method of handling electronic devices installed in networks, providing shared access to the devices for network users, an electronic device (22) is connected either locally to a computer (12) in the network, or via an internal or external electronic device server (24), and then identified on a second computer (6) attached to the network. Further, the device (22) is represented with an individual icon or string in a bar on a screen image. A network address, name, and domain membership are assigned to the device (22). For automatic installation on another computer (8) the icon representing the device (22) is dragged into an icon representing the computer (8) on the screen image.

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**A METHOD OF HANDLING ELECTRONIC DEVICES INSTALLED IN NETWORKS****BACKGROUND OF THE INVENTION****1. Field of the Invention**

The present invention relates to a method of handling electronic devices installed in networks, providing shared access to the devices for network users.

**2. Description of the Prior Art**

For the following description, a network is defined as a set of communication channels interconnecting a set of electronic devices or nodes that can communicate with each other. For example the nodes may be computers, terminals, workstations, peripherals such as printers, scanners, cameras, communication units, or other electronic devices distributed over different locations.

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Manufacturers of electronic devices often develop their own software for installing, managing and using their products. Therefore, the presentation and handling of the devices and their services, from the user's viewpoint, are different with products from different vendors.

For example, in Microsoft Windows it is possible to share printers on a network. They appear in the Network !

Neighborhood where they can be installed into the Printers Folder. However, there is no similar and consistent way of sharing, finding, and installing other peripherals or electronic devices on the network.

Prior art solutions provided for peripherals are in most cases vendor -proprietary in terms of communications and user access. CD -ROM discs are shared as any other disc storage and there is no easy way of finding and accessing them on the network using their name.

Consequently, for sharing other electronic devices the user has to use different tools for each type of brand of device. The future wide Internet and Intranets utilization and use of web browser tools will make this situation more complicated.

#### SUMMARY OF THE INVENTION

The main object of the present invention is to provide a method of handling electronic devices installed in networks.

The method handles electronic devices such as peripherals in operating systems, for example in Microsoft Windows NT or Windows 95, and provides shared access to peripherals for users in a simple and consistent way.

Installation and usage should apply to all network peripherals and other electronic devices independent of their manufacturer.

Further, electronic devices can be connected either locally to a PC, or to another PC on the network, or to an external server, or an internal server incorporated in an electronic device, without difference to the device driver or service in the operating system, or to the user using it. Thus, the user handles electronic devices in the same way without knowledge about how and where they are connected.

This is accomplished by the features and steps disclosed in the characterizing part of claim 1.

#### BRIEF DESCRIPTION OF THE DRAWINGS

In order to explain the invention in more detail and the advantages and features of the invention references in the following detailed description of the preferred embodiment are made to the accompanying drawings, in which  
FIG 1 is an illustrative view of an example of a computer network;  
FIG 2 shows an example of a screen image on a computer, exploring its peripherals folder;  
FIG 3 shows a screen image on the same computer as in FIG 1, exploring a specific computer;  
FIG 4 is an illustrative view of the computer network in FIG 1, further comprising a scanner;  
FIG 5 shows the same screen image as in FIG 2 with a scanner installed; and  
FIG 6 shows the same screen image as in FIG 3 with a scanner installed.

#### DETAILED DESCRIPTION OF THE INVENTION

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The present invention is a method of handling electronic devices installed in networks, providing users shared access to the devices in an intuitive way.

Any organization utilizing computers needs a reliable and pervasive internal and external communication network to be able to successfully do business. The growth of the Internet and Intranets is evidence thereof.

The more the LAN (Local Area Network) is seen as an essential and vital piece of infrastructure, the more everyone wants everything connected to it. End users benefit from sharing office resources on the network as they get a more flexible environment with greater access to better equipment. It is also a cost efficient way to build up an information infrastructure in a company.

Hence, a number of dedicated servers with local intelligence are used in state of the art solutions, and will probably be used increasingly in a network-centric environment. Examples are: print servers for accessing and sharing printers; scanner servers for accessing and sharing document scanners; storage servers serving as dedicated storage devices; etc.

Also, in the future we can assume that networks will grow into homes, connecting other electronic devices such as climate control systems, ovens, stereos, etc. as well as, of course, PCs.

As previously described, the method of the invention is applicable on different kinds of networks, both Internet and Intranets. In order to describe the method of the invention the method is implemented and used in one of several possible network environments, a computer network in the embodiment, which is shown in FIG 1. This network comprises a file server 1 with a terminal 2; a camera 3 connected to the server; a network laser printer 4 connected to the network via a print server 5; workstations 6, Jenny 7 and Henrike 8, with a local ink-jet printer 9; a CD-ROM tower 10 connected to the network via a CD-ROM server 11; personal computers (PCs) Jocke 12, Johan 13, and Johana 14; a local fax 15, a local regular laser printer 16, and a local color laser printer 17 connected to Jocke 12; and a fax 18 connected to the network via a fax server 19.

Several specific devices such as workstations, PCs, printers etc are provided in the network in order to give a more thorough description of the present invention. It will be obvious for those skilled in the art, that the present invention may be practiced with other similar devices and network configurations than those mentioned herein. In other embodiments of the network additional electronic devices can be connected to the network, and different kinds of operating systems can be used. Features well-known to the man skilled in the art are not described in detail so as not to make the present invention overshadowed.

With the intention to make the method of the invention more illustrative, it is implemented in a well-known environment, 95.Windows™

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For example, according to the present invention all devices, such as printers, scanners, cameras etc shared on the network, are found when browsing the Network Neighborhood (in Microsoft Windows 95 and Windows NT). In the same way as application programs, electronic devices are represented with icons on a screen describing the type of electronic devices installed.

In the following screen images same reference numbers are used for the icons as for the corresponding electronic devices.

An example of a screen image on Henrike 8 exploring a Peripherals Folder is illustrated in FIG 2. In this embodiment Henrike 8 itself is called "My Computer" in the

Explorer. Henrike 8 is provided with an internal 3 1/2 floppy disc (A:), a hard disc (C:), and some peripherals. Since the peripheral icon is

highlighted, peripherals presently available on/to Henrike 8 are shown in the Peripherals Folder in the shape of icons, representing a local printer ("My local printer") corresponding to the printer 9 in FIG 1, a remote printer ("Laser on

Jocke") corresponding to the printer 16 in FIG 1 and a fax ("Out fax on Jocke") corresponding to the fax 15 both connected to Jocke 12. Both the

"Laser on Jocke" and the "Out fax on Jocke" are found on the network, illustrated by a wire symbol 20 at the bottom of the icons.

A screen image exploring Jocke 12 is illustrated in FIG 3. According to FIG 1, the laser printers 16 and 17, and the fax 15 are connected to Jocke 12. Additionally, Jocke comprises an internal CD-ROM drive with a disc Encarta 21.

The method of the present invention is illustrated by the following example, wherein a scanner is attached to a computer and then installed on another computer in the network. In another embodiment the scanner can be attached to the network via an external or internal electronic device server. In that case, the steps of the method are the same.

An administrator connects a first scanner 22 to Jocke 12 (a first computer), as shown in the middle of FIG 4, and turns the power on. Upon returning to his management PC, for example Inge 6 (a second computer), running for example Windows NT Server with the System Management Server (SMS) software, a popup dialog is already on the screen notifying the new scanner. He uses SMS to assign a network address and name, and domain membership to the scanner 22. Then he drags an icon representing the scanner 22 to the icon representing Henrike 8 (a third computer) for automatic installation.

A popup window appears on the screen at Henrike 8 informing the user that a scanner is being installed on his computer. After a short while the installation is ready and the scanner icon appears as "Department Scanner" in the Peripherals Folder. This is illustrated in the FIG 5 and FIG 6. Also, as illustrated by the wire symbol 20 at the scanner icon the scanner 22 is on the network and possibly utilized by several users.

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In the same way, a second scanner 23 can be attached to an internal or external electronic device server 24.

In order to use the scanner 22 a document is put in the scanner and then the scanner icon is dragged into a word processing document (or into its icon). A dialog allows the user to configure the actual scan, enabling e. g.

OCR (optical character recognition) or image recognition.

After a while the scanned document is inserted in the word processing document.

According to the invention, this simplicity of installation and use applies to all electronic devices connected to the network.

Thus, for installing electronic devices such as peripherals for use on a computer, icons are moved to the

Peripherals Folder or to one of the Peripheral Folders, where they appear together with local peripherals.

Then, by using the icons representing the peripherals installed the user can for example: -drag a scanner into a word processing program (WPP),

whereby a document is scanned and OCRed; -drag a document to a printer, whereby the document is printed;

-drag a scanner to a printer, to initiate copying;

-drag a scanner to a fax, to initiate faxing;

-drag a camera into the WPP, whereby a picture is taken and incorporated into a document; -drag a document to a symbol of a person, to e-mail

the document;

-etc.

It is understood that the above actions can be initiated by other means than drag and drop, e. g. by entering commands on a keyboard.

As the amount of installed peripherals and other electronic devices increases, a peripherals bar or electronic devices bar similar to the Task Bar in

Windows 95 can be used for collecting and accessing the most used peripherals and electronic devices.

An installed peripheral or electronic device can, instead of appearing as an icon in the peripherals (devices) folder or in the peripherals (devices)

bar, be represented as an icon or in a bar in a web browser on the World Wide Web.

According to the method of the invention, electronic devices can be connected either locally to a computer or to another computer on the network,

or to an electronic device server, as illustrated in FIG 1, without difference to the device driver or service in the operating system environment or to

the user using it. Thus, the user handles electronic devices in the same way without knowledge about how and where they are connected.

In one embodiment this is accomplished by having local ports such as SCSI, parallel and serial ports together with networked ports appearing as

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general ports to the device drivers and services in the operating system environment, such as Windows NT or Windows<sup>TM</sup> 95 and derivatives

thereof; extending the Network Provider interface to share, display and interact with all types of electronic devices connected to the network,

wherein they appear in the Network Neighborhood as icons describing their type of electronic device; extending the SMB (Server

Message Block, developed by Microsoft), CIFS network protocols to share and communicate with peripherals connected to network ports (e. g.

using SMB pipes); extending the Plug and Play interface of Windows<sup>TM</sup> 95 to operate over the network, enabling automatic installation of correct

device drivers when installing an electronic device in a network.

An imaging subsystem handling scanners, cameras, etc is defined, e. g. in the same way as printing subsystems in the Windows environment.

The electronic device vendor just has to supply a device driver adapting the current application interface, e. g. TWAIN (a standard software protocol

and Application Programming Interface (API) for communication between software applications and image acquisition devices), to the general port

where the device is connected. Further, audio and video systems for input and/or output peripherals such as TVs, video cameras, VCRs, sound

equipment are shared on the network. Additionally, interactive communication services for telephony and videoconference peripherals are provided.

These services define general APIs for peripheral developers implementing specific parts proprietary to their products.

Additionally, electronic devices can be installed and then appear as web-servers in the operating system environment. The web-servers are

accessed in the same way as other network devices or applications described above.

In order to install devices a network administrator is usually not needed. However, the administrator intervention is required when a device or its

host server has to be pre-configured before use, for example to set user access privileges, network addresses and names, and domain

configuration. This is managed with, for example, the System Management Server (SMS), utilizing e. g. the

HyperMedia Management Protocol (HMMP).

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## CLAIMS

1. A method of handling electronic devices installed in networks, providing shared access to the devices for network users, comprising the step of:

connecting an electronic device (22) to the network, either locally to a first computer (12) in the network, or via an internal or external electronic

device server (24); characterized by the further steps of:

identifying the device (22) automatically on a second computer (6) attached to the network, wherein the device is represented by an individual icon

or a string of a bar on a screen image;

assigning a network address, name, and domain membership automatically to the device (22); and

installing the device (22) on any computer (8) or group of computers in the network by dragging the icon representing the device (22) into an icon

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on the screen representing the computer (8) or group of computers, or by entering an install command for automatic installation on the computer (8) or group of computers.

2. A method of claim 1, characterized in that said method further comprises the step of: informing a user of the computer (8), that the device (22) is installed on his computer by representing the device (22) by an icon in a folder or a string of a bar on a screen image of the computer (8).

3. A method of claim 1 or 2, characterized in that said device is a scanner (22), a printer (9), a fax (15), or a camera (3).

4. A method according to any of claim 1-3, characterized in that said method further comprises the step of:  
dragging a first icon, representing a camera (3), into a second icon, representing a word processing program, whereby a picture is taken and then incorporated into a document.

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